

WHAT IS CLAIMED IS:

1. A fine particle separation treatment system comprising:

a storage tank for storing a solution;

a solution circulating passageway for circulating the solution in the storage tank, and

a cyclone separator disposed in the solution circulating passageway for separating fine particles in the solution,

said cyclone separator comprising:

an inlet passageway communicating with a solution outlet side of the storage tank;

a flow-out passageway communicating with a solution outlet side of the storage tank;

a cyclone portion for generating an eddy flow at a given flow rate by feeding a fine particle-containing solution from the inlet passageway, transferring the fine particles to the outer side by a centrifugal force to issue the solution after separating the fine particles from the flow-out passageway, and precipitating the separated fine particles by decelerating the eddy flow; and

a particle trap box for trapping the precipitated fine particles in the cyclone portion through a communication hole,

an electrode rod being disposed at the center of the particle trap box, and

the fine particles being electrically separated by applying a potential between the electrode rod and an electrode of the particle trap box.

2. The fine particle separation treatment system according to Claim 1, wherein the fine particles are electrically separated by charging the electrode rod with the same electric charge as that of the fine particles, and by charging the electrode of the particle trap box with an electric charge opposed to that of the fine particles.

3. The particle separation treatment system according to Claim 1 or 2, wherein the solution circulation passageway further comprises various devices that are operated or work using the solution.

4. The particle separation treatment system according to any one of Claims 1 to 3, wherein the upper end of the electrode rod is elongated to the lower part of the cyclone portion.

5. The particle separation treatment system according to any one of Claims 1 to 4, wherein a conical electrode is

provided at the upper end of the electrode rod, and this conical electrode is positioned so as to abut the communication hole.

6. The particle separation treatment system according to any one of Claims 1 to 5, wherein

the cyclone portion comprises a cylinder part positioned at the upper part of the cyclone portion and a downwardly tapered portion connected to the cylinder part, and

the length of the electrode bar is larger than the diameter of the cylinder part.

7. The particle separation treatment system according to any one of Claims 1 to 6, wherein the distance between the electrode of the particle trap box and the electrode rod is larger than the diameter of the communication hole.

8. A cyclone separator comprising:

a cyclone portion for generating an eddy flow at a given flow rate by feeding a fine particle-containing solution, transferring the fine particles to the outer side by a centrifugal force to issue the solution after separating the fine particles, and precipitating the separated fine particles by decelerating the eddy flow; and

a particle trap box for trapping the precipitated fine particles in the cyclone portion through a communication hole,

an electrode rod being disposed at the center of the particle trap box, and

said electrode rod being charged with the same electric charge as that of the fine particles.

9. A cyclone separator comprising:

a cyclone portion for generating an eddy flow at a given flow rate by feeding a fine particle-containing solution, transferring the fine particles to the outer side by a centrifugal force to issue the solution after separating the fine particles, and precipitating the separated fine particles by decelerating the eddy flow; and

a particle trap box for trapping the precipitated fine particles in the cyclone portion through a communication hole,

the electrode of said particle trap box being charged with an electric charge opposed to that of the electric charge of the fine particles.

10. A cyclone separator comprising:

a cyclone portion for generating an eddy flow at a given flow rate by feeding a fine particle-containing

solution, transferring the fine particles to the outer side by a centrifugal force to issue the solution after separating the fine particles, and precipitating the separated fine particles by decelerating the eddy flow; and

a particle trap box for trapping the precipitated fine particles in the cyclone portion through a communication hole,

an electrode rod being disposed at the center of the particle trap box,

said electrode rod being charged with the same electric charge as that of the fine particles, and

the electrode of said particle trap box being charged with an electric charge opposed to that of the fine particles.

11. The cyclone separator according to Claim 8 or 10, wherein the upper end of the electrode rod is elongated to the lower part of the cyclone portion.

12. The cyclone separator according to Claim 8 or 10, wherein a conical electrode is provided at the upper end of the electrode rod, and is positioned so as to abut the communication hole.

13. The cyclone separator according to Claim 8, 10, 11

or 12, wherein

the cyclone portion comprises a cylinder part positioned at the upper part of the cyclone portion and a downwardly tapered portion connected to the cylinder part, and

the length of the electrode bar is larger than the diameter of the cylinder part.

14. The cyclone separator according to Claim 8, 10, 11 or 12, wherein the distance between the electrode of the particle trap box and the electrode rod is larger than the diameter of the communication hole.